

BEST AVAILABLE COPY

IFW



HH 307-KFM
IOP 02 PCT/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : FELIX KOLLMER and PETER HOERSTER
Serial No. : 10/568,832
Filed : February 17, 2006
For : MASS SPECTROMETER AND LIQUID-METAL ION
SOURCE FOR A MASS SPECTROMETER OF THIS
TYPE
Art Unit : 2878
Customer No. : 010037

July 12, 2006

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

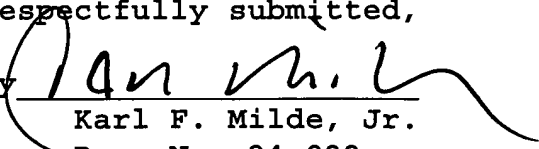
Sir:

TRANSMITTAL OF ENGLISH TRANSLATION OF
PRELIMINARY EXAMINATION REPORT

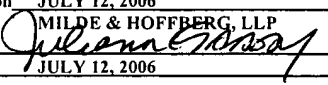
Transmitted herewith for filing, in connection with the
above-referenced patent application, is the English
translation of the International Preliminary Examination
Report for the corresponding International Application No.
PCT/EP2004/007154.

Respectfully submitted,

MILDE & HOFFBERG, LLP
10 Bank Street-Ste. 460
White Plains, NY 10606

By 
Karl F. Milde, Jr.
Reg. No. 24,822

I hereby certify that this correspondence
is being deposited with the United States
Postal Services as first class mail in an
envelope addressed to: Commissioner for
Patents, P.O. Box 1450, Alexandria, VA 22313-1450
20231 on JULY 12, 2006

MILDE & HOFFBERG, LLP
By 
Date JULY 12, 2006

EINGEGANGEN

29. Juni 2006

PAg Dr. Hoffmeister & Tarvenkorn

PCT

NOTIFICATION OF TRANSMITTAL
OF COPIES OF TRANSLATION
OF THE INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY
(CHAPTER I OR CHAPTER II
OF THE PATENT COOPERATION TREATY)
(PCT Rules 44bis, 3(c) and 72.2)

From the INTERNATIONAL BUREAU

To:

HOFFMEISTER, Helmut
Dr. Hoffmeister & Tarvenkorn
Goldstrasse 36
48147 Münster
ALLEMAGNE

Date of mailing (day/month/year) 22 June 2006 (22.06.2006)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference IOP 02-PCT	
International application No. PCT/EP2004/007154	International filing date (day/month/year) 01 July 2004 (01.07.2004)
Applicant ION-TOF GMBH et al	

1. Transmittal of the translation to the applicant.



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

2. Transmittal of the copy of the translation to the designated or elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Agnes Wittmann-Regis
Facsimile No. +41 22 740 14 35	Facsimile No. +41 22 338 89 70

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference IOP 02-PCT	FOR FURTHER ACTION	See item 4 below
International application No. PCT/EP2004/007154	International filing date (<i>day/month/year</i>) 01 July 2004 (01.07.2004)	Priority date (<i>day/month/year</i>) 25 August 2003 (25.08.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant ION-TOF GMBH		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 8 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/>	Box No. I	Basis of the report																							
<input type="checkbox"/>	Box No. II	Priority																							
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																							
<input type="checkbox"/>	Box No. IV	Lack of unity of invention																							
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																							
<input type="checkbox"/>	Box No. VI	Certain documents cited																							
<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application																							
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).																								

<p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 740 14 35</p>	<p>Date of issuance of this report 12 June 2006 (12.06.2006)</p> <p>Authorized officer Agnes Wittmann-Regis</p> <p>Telephone No. +41 22 338 89 70</p>
--	---

Form PCT/IB/373 (January 2004)

TRANSLATION

PCT

(PCT Rule 43bis.1)

To:		PCT	
		WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY	
		(PCT Rule 43bis.1)	
		Date of mailing (day/month/year)	See Form PCT/ISA/210 (sheet 2)
Applicant's or agent's file reference IOP 02-PCT		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/EP2004/007154	International filing date (day/month/year) 01.07.2004	Priority date (day/month/year) 25.08.2003	
International Patent Classification (IPC) or both national classification and IPC H01J49/16, H01L49/40, H01K27/26			
Applicant ION-TOF GMBH			

1. This opinion contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b(a,b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISAE/P	Authorized officer
Facsimile No.	Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/007154

Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 27.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
- a. type of material
- ☐ a sequence listing
- ☐ table(s) related to the sequence listing
- b. format of material
- ☐ in written format
- ☐ in computer readable form
- c. time of filing/furnishing
- ☐ contained in the international application as filed.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/007154

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-7	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-7	NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims		NO
2. Citations and explanations:			
Reference is made to the following documents:			
D1: US-A-4 686 414 (MCKENNA ET AL) 11 August 1987 (1987-08-11)			
D2: S. S. JOHAR, D. A. THOMPSON: "Spike effects in heavy-ion sputtering of Ag, Au and Pt thin films", SURFACE SCIENCE, vol. 90, 1979, pages 319-330, XP002366490			
D3: J. VAN DER WALLE, P. JOYES: "Study of Bi(n) (p+) ions formed in liquid-metal ion sources", PHYSICAL REVIEW B, vol. 35, no. 11, 15 April 1987 (1987-04-15), pages 5509-5513, XP002366516.			
2. INDEPENDENT CLAIM 6			
The present application fails to satisfy the requirements of PCT Article 33(1) because the subject matter of claim 6 does not involve an inventive step (PCT Article 33(3)).			
Document D1 is considered to be the prior art closest to the subject matter of claim 6. Said /...			

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/007154

Box No. V

Reasoned statement under Rule 43bis.I(a)(i) with regard to novelty, inventive step or industrial applicability:
citations and explanations supporting such statement

document discloses (the references in parentheses are to D1):

an ion source (figure 4), which source has a heatable (14) ion emitter (12) coated in the field-exposed area with a liquid metal layer (24) which contains an ionisable metal (column 7, lines 6-16) that is emitted and ionised as a primary ion beam (32, 36), said primary ion beam containing metal ions with different ionisation stages (implicit; cf. document D3, figure 1) and cluster states, the liquid metal layer consisting of an alloy that contains bismuth and has a low melting point (column 7, lines 6-16), wherein a bismuth ion mixed beam can be emitted with the ion emitter, under the influence of an electric field (figure 4) (implicit; cf. document D3, figure 1).

Thus, the subject matter of claim 6 differs from the subject matter known from D1 in that one of a number of types of bismuth ion, the mass of which is a multiple of the monatomic, singly or multiply charged bismuth ions Bi_n^{+p} , is to be filtered out - using a filter device - as a mass-pure ion beam comprised solely of ions of type Bi_n^{+p} , in which $n \geq 2$ and $p \geq 1$, and n and p respectively are natural numbers.

The problem addressed by the present invention can consequently be regarded as that of increasing the

/...

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/007154

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

efficiency of the ion source for the production of secondary ions.

The solution to the above problem, as proposed in claim 6 of the present application, cannot be considered inventive. The reasons are as follows (PCT Article 33(3)):

with regard to the use of filtered Bi_2 ions and other filtered clusters for the production of secondary ions, document D2 (table 1; figure 5) describes the same increase in efficiency in the production of the secondary ions as that disclosed in the present application. A person skilled in the art would therefore consider the incorporation of this feature into the ion source described in D1 to be a conventional measure for solving the problem of interest (PCT Article 33(3)).

3. DEPENDENT CLAIMS 1-5 AND 7

Claims 1-5 and 7 contain no features which, combined with the features of any claim to which they refer, meet the PCT requirements for inventive step:

claims 1 and 3: the use of the aforementioned ion source in a secondary ion mass spectrometer is considered to be standard practice; the choice of a time-of-flight mass spectrometer therefor is an obvious alternative;

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/007154

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

claim 2: document D2 (table 1) describes the use
of Bi₂ ions; the simple ionisation here is
considered to be standard;

claim 3: the emission stream described is within
the conventional range for liquid metal ion
sources.

Claims 5 and 7: document D1 (column 7, lines 6-16)
describes the use of a Pb Bi Sn alloy.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/007154

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claim 6 appears to contain an error. An ion source is claimed. However, said claim contains the following feature: "[and] with a spectrometer unit for the mass analysis of secondary particles", which cannot be part of the claimed ion source, being part of a mass spectrometer (see the similar passage in claim 1). Since the scope of protection of claims 1 and 6 in their present form would have be identical and, in consequence, said claims would be redundant, the examination is based on the assumption that the aforementioned feature is not included in claim 6 and that the ion source is claimed alone, without the associated mass spectrometer.

Although claim 1 is drafted as an independent claim, it contains all the features of independent claim 6. Claim 1 is therefore considered to be dependent on claim 6.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☒ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER: _____**

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.